

# Fraction Strip Addition

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**Reporting Category** Computation and Estimation

**Topic** Adding fractions

**Primary SOL** 4.5 The student will  
b) add and subtract fractions having like and unlike denominators that are limited to 2, 3, 4, 5, 6, 8, 10, and 12, and simplify the resulting fractions, using common multiples and factors.

**Related SOL** 4.5a, d

## Materials

- Sets of Fraction Strips (attached)
- Fraction Sum Sheet (attached)

## Vocabulary

*fraction, mixed number, improper fraction, like denominators, unlike denominators, estimation, simplify, simplest form, factor, least common denominator, common factors, common multiples, greatest common factor (GCF), least common multiple (LCM), add, sum*

## Student/Teacher Actions (what students and teachers should be doing to facilitate learning)

Note: Be sure to introduce students to fraction strips prior to this activity. Before undertaking this activity, make a complete set of fraction strips—one strip each for 1 whole (1 unit), 2 halves, 3 thirds, 4 fourths, and so forth—for each student. Copy each sheet of the attached fraction strips on a different color of cardstock and cut out the strips. Since each strip is the same length, they can be overlapped and/or folded to work problems and will probably be easier to use in complete-strip format. If a student has difficulty understanding overlapping, the strips may be cut apart. Students who experience difficulty with the unlike denominators (step 1 below) may need additional examples.

1. Give each student a complete set of fraction strips. Use the attached Fraction Sum Sheet to model several problems for the class. For example, “Add the fractions  $\frac{1}{2}$  and  $\frac{1}{4}$  on your unit strip. What is the sum?” ( $\frac{3}{4}$ ) “How many  $\frac{1}{8}$  pieces does it take to cover your answer?” (6) “What is another way to express  $\frac{3}{4}$  as a fraction?” ( $\frac{6}{8}$ )
2. Ask students, “What is a good estimate of the sum of  $\frac{3}{4}$  and  $\frac{3}{8}$ ?” Students may need help at this point because the answer is greater than one. Encourage them to overlap the fourths strip and the eighths strip to find the answer. They should be able to tell you that the answer is equivalent to 9 eighths, or to 1 whole and 1 eighth. Encourage them to reference the space on a number line between 0 and 1 to guide their thinking.

3. Ask students, “What is a good estimate of the sum of  $\frac{2}{3}$  and  $\frac{3}{4}$ ?” Students may not be able to give this answer, as the thirds strip and the fourths strip do not fit together exactly. Encourage them to experiment with their other fraction strips until someone discovers that twelfths will work. Model  $\frac{2}{3}$  as  $\frac{8}{12}$  and  $\frac{3}{4}$  as  $\frac{9}{12}$ . Make sure that all students understand that 17 twelfths, or 1 whole and 5 twelfths, will model this sum exactly. The more experience students have with discovering equivalent fractions, the easier it is for them to understand simplifying fractions. Transparent copies of the fraction strips might help. Do not mention rules for addition unless students bring them up. The emphasis here should be on visualization of the fraction sum and visualization of an equivalent sum.
4. Give each pair of students a copy of the Fraction Sum Sheet. Display the following fraction problems, and instruct student pairs to work with their fraction strips to find the sums and to record the equivalent fractions they used.
 

a. $\frac{5}{12} + \frac{1}{3} = \underline{\hspace{1cm}}$	b. $\frac{1}{8} + \frac{1}{4} = \underline{\hspace{1cm}}$	c. $\frac{5}{8} + \frac{7}{8} = \underline{\hspace{1cm}}$
d. $\frac{2}{3} + \frac{5}{6} = \underline{\hspace{1cm}}$	e. $\frac{7}{10} + \frac{1}{2} = \underline{\hspace{1cm}}$	f. $\frac{5}{6} + \frac{2}{3} = \underline{\hspace{1cm}}$
5. Ask each pair to discuss the strategies they used, and have them look for patterns. Display the problem  $\frac{3}{4} + \frac{7}{8} = \underline{\hspace{1cm}}$ . Ask each student to find the sum and write a short paragraph justifying the answer. Also, create a problem situation to match the number sentence. Encourage drawings or diagrams. Allow each group time to discuss their answers, and then call for responses.

### Assessment

- **Questions**
  - How do you know whether your sum is in simplest form?
  - Why can’t we add fractions with unlike denominators?
- **Journal/Writing Prompts**
  - Using one of the problems you solved, create a problem situation to reflect the addition of the fractions. Include drawings.
  - Use color tiles to create a picture, and describe the picture, explaining the part of it that is red, the part that is blue, the part that is green, etc. For example, “ $\frac{1}{6}$  of my picture is made of red tiles,  $\frac{1}{6}$  of it is made of blue tiles, and  $\frac{4}{6}$  (or  $\frac{2}{3}$ ) is made of green tiles.”

### Extensions and Connections (for all students)

- Have students use a variety of manipulatives as tools to help them add fractions having like and unlike denominators.

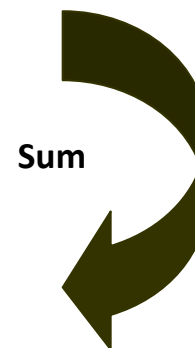
# Fraction Sum Sheet

Fraction      Denominators

<div style="border: 1px solid black; width: 40px; height: 40px; margin: 0 auto;"></div>		<div style="border: 1px solid black; width: 40px; height: 40px; margin: 0 auto;"></div>
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## Fraction Strips — One Whole (One Unit)

<b>1</b>
<b>1</b>
<b>1</b>
<b>1</b>
<b>1</b>

## Fraction Strips — Halves

$\frac{1}{2}$	$\frac{1}{2}$
$\frac{1}{2}$	$\frac{1}{2}$
$\frac{1}{2}$	$\frac{1}{2}$
$\frac{1}{2}$	$\frac{1}{2}$
$\frac{1}{2}$	$\frac{1}{2}$

## Fraction Strips — Fourths

$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$
$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$
$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$
$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$
$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$

## Fraction Strips — Eighths

$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$
$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$
$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$
$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$
$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$

## Fraction Strips — Tenths

$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$
$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$
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## Fraction Strips — Thirds

$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{3}$
$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{3}$
$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{3}$
$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{3}$
$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{3}$

## Fraction Strips — Sixths

$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$
$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$
$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$
$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$
$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$

## Fraction Strips — Twelfths

$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$
$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$
$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$
$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$
$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$